Accordingly, the expansion of the implant in the vertebra is achieved by support under the plates allowing the thrust force to be distributed over the length of the plates under the latter. Thus a sufficient length of the plates may be provided while limiting an excessive dimensioning of the thickness of the latter in order to resist flexion. It will be appreciated by those of ordinary skill in the art that the implant according to some embodiments of the invention adopts a ratio of a spatial requirement in length (un-expanded) to length of elevated plate which is extremely optimized, allowing a preferable use of the limited intra-osseous spaces with a view to fracture reduction, for example.

The rod **3316** may also include, according to one of the embodiments of the invention, a disengagement means, which may comprise an internal hex on the proximal end **3318** of the rod. This may allow one to disengage the rod from the implant once the implant has been opened out. Alternatively, where the handle is not attached to the gripping block and/or implant carrier, the handle could be counter-rotated (i.e., rotated such that the rod does not move in a direction away from the implant) such that it travels away from the flush portion of the gripping block and implant carrier, such that it engages the proximal end of the rod. Further counter-rotation of the handle (after opening out of the implant) causes the rod to rotate in the same counter-rotation as the handle, thereby causing the rod to disengage from the implant. Depending upon the determined thread pitch, such disengagement can occur in any number of rotations (e.g., less or more than one rotation). See also FIG. **26**

Preferably, after the rod has been removed, a filling material **74** is injected around the implant. The filling material may comprise, for example, an ionic cement, in particular, a phosphocalcic cement, an acrylic cement or a compound of the latter, with a view to filling in and around the implant. To accomplish this, a needle of the injector **73** is slid down tube **67** until the end of the needle reaches the distal orifice **39** of the implant **1** (FIG. **27**). The filling material is then injected via the needle. Continued injection in a retrograde manner may be done up to a proximal orifice in cortical bone **64** of the vertebra **60** (FIG. **28**). The needle of the injector may then be withdraw from tube **67** (FIG. **29**). A second example of a method according to an embodiment of the invention for restoration of human bone anatomy, will now be described with references to FIGS. **30-32**. This example generally concerns a method for bone restoration of a vertebra by a transpedicular route, with fracture reduction.

The second example is similar to the first and differs from the latter by the penetration route of the implant into the vertebra **60**, which is now accomplished in a transpedicular manner (FIG. **30**) instead of the posterolateral route used in the first method. As a result, only some steps of the second method have been represented in FIGS. **30-32** in order to show the different route used for the introduction of the implant **1** into the vertebra. For FIGS. **30** to **32**, elements identical to those of the first method example have the same numerical references, and those figures correspond respectively to the steps of FIGS. **24**, **25** and **28** of the first method example. Concerning the step represented in FIG. **32**, the latter differs slightly from FIG. **28** by the position of the needle of the injector **73**, closer to the distal end of the implant in FIG. **32**.

It will thus be seen that the invention attains the objects made apparent from the preceding description. Since certain changes may be made without departing from the scope of the present invention, it is intended that all matter contained in the above description or shown in the accompanying drawings be interpreted as illustrative and not in a literal sense (and thus, not limiting). Practitioners of the art will realize that the method, device and system configurations depicted and described herein are examples of multiple possible system configurations that fall within the scope of the current invention.

What is claimed is:

1. An expansible implant for bone restoration comprising:

a single plane of expansion intrinsic to the implant, wherein the single plane of expansion corresponds to a bone restoration plane;

first and second opposed plates respectively forming first and a second bearing surfaces for the bone, wherein the first and second plates move away from one another according to the single plane of expansion at the time of the expansion of the implant by application of a longitudinal force to the implant;

first and second supports for each of the first and second bearing surfaces, located adjacent each plate respectively; and

a material web provided between each support and a corresponding plate, wherein the material web plastically deforms during expansion of the implant to control expansion of the implant.

2. The expansible implant according to claim **1**, wherein the controlled expansion substantially preserves the implant at any determined expansion value between an initial minimum thickness of the implant before any expansion and a maximum thickness of the implant after maximum expansion.

3. The expansible implant according to claim **1**, wherein at least one first support of at least one of the plates is shorter in length than a corresponding second support, such that upon expansion of the implant, the first and second plates move at an angle to one another.

4. The expansible implant according to claim **1**, wherein the first and second supports comprise a pair of first and second supports.

5. A method for restoration of human or animal bone anatomy, comprising:

introducing, into a bone, an expansible implant having:

a single plane of expansion;

at least one plate forming a bearing surface for bone, wherein upon expansion of the implant by application of a longitudinal force to the implant, the plate is directed away from a longitudinal axis of the implant according to the single plane of expansion at the time of the expansion of the implant;

a first end;

a second end;

at least one support for at least one plate; and

a first zone of material provided between a first end of the at least one support and the at least one plate, wherein the first zone plastically deforms during expansion of the implant for controlling the expansion of the implant;

positioning the expansible implant in the bone in order to correspond the single plane of expansion with a bone restoration plane, and

expanding the implant in the bone restoration plane by applying a longitudinal force to the implant.

6. The method according to claim **5**, wherein the controlled expansion substantially preserves the implant at any determined expansion value between an initial minimum thickness of the implant before any expansion and a maximum thickness of the implant after maximum expansion.